

REMARKS

Reconsideration of the above-identified application is respectfully requested.

As a preliminary matter, all pending Claims 1-22 and 29-33 are being canceled herein, thus obviating the Examiner's objection to Claim 30 and rejection of Claims 12, 16, 22 and 30 under 35 U.S.C. 112, second paragraph. Applicants had previously canceled Claims 23-28 reserving the right to file these claims as a divisional/continuation application.

New Claims 34-52 are being added to replace canceled Claims 1-22 and 29-33.

In the Official Action, the Examiner objected to the drawings as not showing every feature of the invention specified, and particularly, the embodiment directed to two solid-state imaging devices (CCD's) which had been set forth in previously presented (now canceled) Claim 19. In response, a new drawing Figure 30 is being added to this case that sets forth this feature which is described in detail in the specification at page 63, beginning at line 15 et seq., and as set forth in new Claims 37 and 45. The specification is additionally being amended to set forth the addition of new Figure 30 in the description thereof originally provided on page 63. Respectfully, no new matter is being added.

Further in the Office Action, the Examiner had rejected Claims 1-10, 12, 14-22 and 29 under 35 U.S.C. §103(a) as being unpatentable over Palcic et al. (U.S. Patent No. 5,827,190) in view of Hynecek (U.S. Patent No. 5,337,340) and further rejected Claims 1, 2, 4-10, 12, 15, 16, 20, 21 and 29 under 35 U.S.C. §103(a) as being unpatentable over Sekiguchi (U.S. Patent No. 4,821,117) in view of Hynecek. Claims 1-22 and 29-33 were further rejected under 35 U.S.C. §103(a) as being unpatentable over Imaizumi et al. (U.S. Patent No. 6,293,911) in view of Hynecek and Claims 30 and 31 were further rejected under 35 U.S.C.

§103(a) as being unpatentable over Palcic in view of Hyncek and further in view of Imaizumi.

Applicants submit that the cancellation of all pending claims obviates the Examiner's rejections under 35 U.S.C. §103(a). Further, new added Claims 34-52 are patentably distinct from each of the cited prior art references whether taken alone or in combination.

Particularly, one aspect of the present invention, as now set forth in new independent Claim 34 is directed to an endoscope system comprising:

- an endoscope provided with a solid-state imaging device having therein an electron multiplication mechanism to vary an electron multiplication rate and change a sensitivity of the solid-state imaging device based on sensitivity control pulses supplied;

- a signal processing unit for processing a signal output from the solid-state imaging device;

- a light source unit for irradiating an object; and

- a sensitivity control unit for controlling a sensitivity by controlling the number or amplitude of the sensitivity control pulses to vary the electron multiplication rate, the sensitivity control unit controlling the number of the sensitivity control pulses or amplitude of the sensitivity control pulses so that a level of a signal from the solid-state imaging device may be of a predetermined value.

Care has been taken to ensure that no new matter is being entered in new Claim 34 as support for the sensitivity control unit for controlling a sensitivity whereby the level of a signal from the solid-state imaging device may be of a predetermined value (as set forth in new Claims 34 and 41) may be found in the specification, for example, at page 53,

lines 3, et seq. and page 57, lines 1, et seq. in support of Figures 17-23 of the present application.

A further aspect of the present invention, as now set forth in new independent Claim 47, is directed to an endoscope system comprising:

an endoscope provided with a solid-state imaging device having therein an electron multiplication mechanism to vary an electron multiplication rate and change the sensitivity of the solid-state imaging device based on sensitivity control pulses supplied;

a signal processing unit for processing a signal output from the solid-state imaging device;

a light source unit for irradiating an object;

a sensitivity control unit for controlling a sensitivity by controlling the number or amplitude of the sensitivity control pulses to vary the electron multiplication rate, the sensitivity control means controlling the number or amplitude of the sensitivity control pulses so that the electron multiplication rate of the solid-state imaging device may be of a predetermined level; and

an auto-gain control circuit for amplifying a signal from the solid-state imaging device of which the sensitivity has been controlled so that the level of the signal may become a predetermined value if it is lower than the predetermined level.

Support for the automatic gain control element set forth in new Claims 42, 47 and 52 may be found in the specification at page 58, lines 6, et seq. and care has been taken to ensure that no new matter is being entered.

In the Office Action, the Examiner had first argued that the combination of Palcic (which teaches a system that increases illumination by combining pixels of the CCD sensor array using a dynamic binning technique to thereby adjust light sensitivity at the time

of fluorescence light observation) and Hynecek (which teaches a solid-state imaging device of which the sensitivity may be varied, however, not in an endoscope) suggested Claims 1-10, 12, 14-22 and 29 of the present invention (now canceled).

The Examiner further argued that the combination of Sekiguchi (which teaches the use of an image intensifier to provide amplification of the fluorescent images (See col. 3, lines 36-37 of Sekiguchi)) and Hynecek (which teaches a solid-state imaging device of which the sensitivity may be varied, however, not in an endoscope) suggested Claims 1, 2, 4-10, 12, 15, 16, 20, 21 and 29.

The Examiner further argued that the combination of Imaizumi (which teaches a fluorescent endoscope device appearing to have a CCD in which amplification factor is varied mounted therein. In that described embodiment, a single light source means irradiates while switching between normal light and fluorescent light, and an AGC is included to provide electric amplification with respect to the output of the CCD and Hynecek (which teaches a solid-state imaging device of which the sensitivity may be varied, however, not in an endoscope) suggested Claims 1-22 and 29-33.

Applicants respectfully submit that the distinctive differences between the present invention and the cited references, whether taken alone or in combination, includes:

(1) that the sensitivity control means amplifies the output signal so that the level of the output of CCD may become a predetermined value (i.e., new Claims 34 and 41); and,

(2) the provision of an amplifier circuit (means) for electrically amplifying the output signal of CCD if the output of CCD amplified by the sensitivity control means is less than a predetermined level (i.e., new Claims 42, 47 and 52).

As regards to the difference (1), it is noted that in Imaizumi, there is described “to control amplification factor”, which may be considered to correspond to the electron multiplication rate (of a fixed value) in the present invention when interpreted in light of the disclosure in Imaizumi at column 41, lines 56-62. However, it seems that there is neither disclosure nor suggestion in Imaizumi directed to controlling the amplification factor so that the level of the output value of the CCD may become a predetermined value as set forth in new Claims 34 and 41. Further, as regards Palcic reference, Palcic appears to suggest the means for increasing illumination by pixeling (i.e., “binning” pixels) at the time of fluorescence light observation. However, the binning technique as taught therein is different from the technique of the invention that involves sensitivity level controlling so that the output level of the CCD may become a predetermined value. It is further noted that Palcic does not describe in detail the method of amplifying. Further, as regards to Sekiguchi, in the description of the embodiment corresponding to Fig. 1 of the Sekiguchi reference, there is described “to amplify the image of light of fluorescence by the image intensifier”, however, it is not exactly made clear how to control the amplifying.

As regards to the differences (2), the Imaizumi reference is the only reference that appears to disclose both an amplifying function in the CCD and an “AGC” circuit. Although the Imaizumi reference discloses both simply an amplifying function in the CCD and an “AGC” circuit, the corresponding description at column 42, lines 17-19 of Imaizumi suggests that the output signal from CCD is always amplified by AGC at the side of the processor (otherwise, it is not clear what kind of control is to be effected). That is, there is no teaching or suggestion of providing further amplification of the output of CCD (control by the sensitivity control means) to a predetermined level. Moreover, there is no suggestion or

teaching in the other references of an endoscope device having the constitution of both sensitivity control means and AGC.

Hence, it is respectfully submitted that it is not obvious for a person skilled in the art in view of the cited references to have AGC to amplify in case the output signal of CCD amplified by the sensitivity control means (means) is less than a predetermined value.

In view of the foregoing, it is respectfully submitted that the new independent Claims 34 and 41 setting forth sensitivity control means for amplifying the output signal so that the level of the output of CCD may become a predetermined value is neither taught nor suggested by the combination of prior art documents in the manner as applied by the Examiner in the Office Action, and consequently, are patentable thereover.

It is further respectfully submitted that the new independent Claims 42, 47 and 52 setting forth an auto-gain control circuit for amplifying a signal from the solid-state imaging device such that the output value (level of the output value) of CCD may become a predetermined value with respect to the sensitivity control unit output level is neither taught nor suggested by the combination of prior art documents in the manner as applied by the Examiner in the Office Action, and consequently, are patentable thereover.

In view of the foregoing remarks herein, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance be issued. If the Examiner believes that a telephone conference with the Applicants' attorneys would be advantageous to the disposition

of this case, the Examiner is requested to telephone the undersigned, Applicants' attorney, at the following telephone number: (516) 742-4343.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Steven Fischman", with a long horizontal flourish extending to the right.

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